factory definition of maximum, and after having previously treated irregular physical curves, the statement is made (page 30), "then at points on the graph at which either y is a maximum or a minimum, the tangent is parallel to the axis of x." The possibility of a maximum being either a corner point or an end value, while illustrated in figures used in other connections (*e. g.*, Fig. 27, Fig. 46 and Fig. 57) is not even acknowledged throughout the whole book. Again, the sixth chapter bears the title "Differential Equations and Indefinite Integrals," but except for their place in the title the terms "integral," and "indefinite integral" do not appear in the text of the chapter, although assumed as familiar, page 68, example 9.

The term "derivative" appears nowhere in the book, the phrase "differential coefficient" being defined instead, although this in turn is casually referred to as "the differential" in example 40, page 35. The notion of a differential as distinguished from a derivative, according to the usage familiar to American readers, is never suggested.

It has been a tradition that even an approach to the meaning of a differential equation is in the nature of things inaccessible to a student who has not been drilled in so elementary a subject as trigonometry. This tradition is completely ignored in the present little treatise. Here a student with but the rudiments of algebra may easily acquire a grasp of what is meant by a differential equation, a definite integral and other fundamental terms, although applying these only to the "powers of x." It is true that the free use of technical nomenclature in some of the exercises might more than appal the American college freshman whose mathematical foundations have carefully shielded him from the harsh realities of "applications." Just how successfully from the pedagogical viewpoint the subject of the calculus may be split in a not unfamiliar fashion according to the functions used rather than the fundamental concepts employed, can only be examined in the light of the whole subject, and so far as this work is concerned judgment must be withheld since part two is not yet published. The efficiency of the part here at hand however raises squarely the issue as to whether the claims of the calculus as a freshman subject can be ignored even in institutions whose students are generally poorly prepared.

To the attention of all college teachers interested in the closer relationship between elementary mathematical technique and physical applications, as taught with simplicity and directness, this little book is recommended.

ALBERT A. BENNETT.

Des phénomènes gyroscopiques et de leurs principales applications à la navigation. By A. LUCAS. Paris, Challamel, 1918. Royal 8vo. 110 pp. Price in boards 7.80 francs.

Contents—Chapter I, Préliminaires, 1–20: Projections de la vitesse et de l' accélération d'un mobile sur trois axes rectangulaires; Equations du mouvement d'un point matériel et d'un corps solide libre; Mouvement d'un corps solide par rapport à des axes animés d'un mouvement de translation avec lesquels il est entraîné; Rotations; Composition des rotations; Problème sur le mouvement d'un corps ayant un point fixe; Moments d'inertie; Mouvement d'un corps

solide autour d'un axe fixe. Chapter II, Corps de révolution en rotation autour de son axe, 21–38: Problème sur les projections de l'accélération d'un point matériel; Effets produits par les accélérations; Etude de l'effet combiné de deux rotations; Généralisation pour un corps libre de révolution; Effets des forces qui agissent sur un corps en rotation; Etude analytique de l'effet du couple P; Cas ou le corps de révolution a un point de son axe fixe. Chapter III, Applications, 39–107; Gyroscope de Foucault; Gyroscope-marin de E. Dubois; Boussole gyroscopique de Foucault; Compas gyroscopique; Perturbations produites à bord sur l'appareil; Influence de la variation de vitesse du tore; Horizontalité de la rose; Amortissement; Compas gyroscopique Sperry; Emploi du gyroscope sur les torpilles; Projectile oblong; Toupie ordinaire; Balance gyroscopique; Toupie gyroscopique; Gyroscope-collimateur de l'amiral Fleuriais; Effet des frottements; Effet des mouvements du navire; Effet de la rotation de la terre; Utilisation des principes précédents pour déterminer à bord avec un sextant la hauteur d'un astre; Erreur d'horizontalité ou collimation du repère; Autre procédé d'observation; Mouvement de la terre autour de son centre de gravité; Effets gyroscopiques sur les turbines; Gyroscope stabilisateur.

Rehabilitation Monographs. Joint Series No. 26. Unit Course.—Mathematics I. Use of the Slide Rule. [By W. E. Breckenridge.] Issued by the Federal Board for Vocational Education in coöperation with the Surgeon General's Office and the Bureau of War Risk Insurance. February, 1919. (Trial Edition.) Washington, Government Printing Bureau. 27 pp.

Extract from the preface: "For the purpose of insuring a continuous program of education for wounded and sick soldiers during the time they are in the general hospitals and after their discharge the Surgeon General's Office and the Federal Board for Vocational Education coöperated in the preparation of a series of courses of study. These courses are tentative and suggestive. They may, however, be accepted as models so far as their form and principles which govern their organization are concerned, for all courses whether academic or vocational, where the adjustment of materials is intended to be made to suit the individual capacities and attainments of students."

NOTES.

Il Bollettino di Matematica, 1917–18 (anno 15), contains a sketch of Giuseppe Veronese by P. Gazzaniga (pages 53–65), and an Italian translation with elaborate notes by M. Domenico, of the first of J. W. Young's lectures on *Fundamental Concepts of Algebra and Geometry* (pages 161–183). The complete translation of this work into Italian was referred to in our issue for June.

Vuibert, of Paris, has announced that publication of the following mathematical periodicals is to be resumed this month: *L'Education Mathématique* (which last appeared in July, 1914) and *Revue de Mathématiques Spéciales* (last published in September, 1914).

In our issue for April we had occasion to refer to the publication of the first five parts of *Materialien für eine wissenschaftliche Biographie von Gauss,* edited by Klein, Brendel and Schlesinger. In the latter part of 1918 a sixth part, of 46 pages, by P. Maennchen, was published. It was entitled: *Die Wechselwirkung zwischen Zahlenrechnen und Zahlentheorie bei C. F. Gauss.*

To take the place of *Minerva,* long sent out from Germany, Gauthier-Villars advertises the first volume of an annual, published under the direction of the mathematician Dr. R. de Montessus de Ballore, with the following title: *Universitatum et Eminentium Scholarum, Index Generalis. Annuaire Général des Universités. The Yearbook of the Universities.* (Paper, 18 francs; bound, 21 francs.)